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714-513-1415 FAX 714-513-1278

January 25, 1999

Lockheed Martin Corporation 2550 N. Hollywood Way, 3<sup>rd</sup> Floor Burbank, California 91505

Attention:

Mr. John Hemmans

Project Coordinator

Subject:

November 1998 Data Report
Water Supply Contingency Plan
Production Well Sampling Program

Crafton-Redlands Plume Project

Dear Mr. Hemmans:

This report presents a summary of field procedures, protocols, and results of the Water Supply Contingency Plan production well sampling for the month of November 1998. The Water Supply Contingency Plan (WSCP) was prepared by Lockheed Martin Corporation and submitted to the State of California Regional Water Quality Control Board (RWQCB) Santa Ana Region on September 30, 1996. The plan was conditionally approved by the RWQCB in a letter dated March 6, 1997. The WSCP for the Crafton-Redlands Plume was prepared to address maintenance of water supply to purveyors in the event that wells became impacted with trichloroethene (TCE) from the Crafton-Redlands TCE Plume. A summary of key dates and WSCP sampling program evolution is provided on Table 1.

The locations of the 31 WSCP wells and analytical results for the November 1998 sampling event for TCE and perchlorate are shown on Figures 1 and 2, respectively. Table 2 presents a summary of analytical tests performed on each WSCP well and water system sampling point. The sampling frequency of each well is once a month for the first year. More frequent sampling, if required, is based on the analytical results as outlined in the WSCP TCE and perchlorate decision matrices, provided as Figures 3 and 4, respectively. The perchlorate decision matrix was presented in the *Perchlorate Work Plan and Schedule*, which was submitted, to the RWQCB on August 15, 1997. The RWQCB approved the Perchlorate Work Plan on

October 31, 1997. Table 3 presents a summary of the wells sampled twice monthly according to the decision matrices.

#### **RESULTS**

A summary of the analytical results for the November 1998 WSCP sampling event for TCE and perchlorate is shown on Figures 1 and 2, respectively and presented on Table 4. Available groundwater elevation data measured by purveyor personnel is provided on Table 5. Chain-of-custody and laboratory data sheets are in Attachment B and Level III QA/QC documentation is in Attachment C. Appendices A, B, and C are available upon request.

#### Trichloroethene

Trichloroethene was detected at or above the detection limit of 0.5  $\mu$ g/L in six wells including; COLL Mountain View #1 (1.5  $\mu$ g/L), Gage 6 New (2.1  $\mu$ g/L), Gage 26-1 (11  $\mu$ g/L), Gage 27-1 (5.2  $\mu$ g/L), Gage 27-2 (1.8  $\mu$ g/L), and Gage 92-1 (0.59  $\mu$ g/L), as shown on Figure 1 and Table 4.

Groundwater samples collected from the remaining WSCP wells and system sampling points did not detect TCE. These wells included: nine Gage wells (Gage 29-1, Gage 30-1, Gage 31-1, Gage 46-1, Gage 51-1, Gage 56-1, Gage 66-1, Gage 92-2, and Gage 92-3), three COLL wells (Mountain View #2, Richardson #1, and Richardson #2), the SCE #2 (AUX) well, three City of Riverside water system sampling points (Iowa Booster, Gage Delivery and 7<sup>th</sup> & Chicago), one irrigation sampling point (Gage Arlington), and three City of Loma Linda sampling points (Mountain View Blend – Timoteo, Mountain View Blend – Lawton, and Richardson Blend). The trip blanks were also below the detection limit for TCE.

According to the TCE decision matrix (Figure 3), if a well meets or exceeds  $2/5^{th}$  of the MCL for TCE and the TCE is a result of the Crafton-Redlands Plume, a confirmation sample will be collected during the next regularly scheduled sampling of that well. If the result is confirmed, the well will then be sampled on a twice-monthly basis for three months. At the conclusion of three months if the average TCE concentration is below  $2/5^{th}$  of the TCE MCL (i.e.,  $2.0~\mu g/L$ ) the well will be sampled once a month. If the average TCE concentration is greater than  $2/5^{th}$  of the TCE MCL, then, the well will continue to be sampled on a twice-monthly basis for another three months.

If a well meets or exceeds the MCL for TCE, and the TCE is a result of the Crafton-Redlands Plume, two confirmation samples will be collected within 48 hours. If the results are confirmed, temporary corrective action will be implemented. Three groundwater samples collected in November exceeded the MCL for TCE of 5.0  $\mu$ g/L or 2/5<sup>th</sup> the MCL for TCE (2.0  $\mu$ g/L). These wells are Gage 26-1 (11  $\mu$ g/L), Gage

27-1 (5.2  $\mu$ g/L), and Gage 6 New (2.1  $\mu$ g/L). The TCE impacts at Gage 26-1 and Gage 27-1 are attributed to the Norton Air Force Base plume. Thus, more frequent TCE sampling will not be implemented. Gage 6 New is no longer in use for potable water supply and is only sampled for monitoring purposes.

#### Perchlorate

The perchlorate decision matrix states that if perchlorate is detected in any well at or above the PAL of 18  $\mu g/L$  for the first time, two confirmation samples will be collected within 48 hours of receipt of results. If the perchlorate result is confirmed the purveyor, the RWQCB, and the DHS will be notified. If perchlorate is detected in any well at or above 75 percent of the PAL of 18  $\mu g/L$  (i.e. 13.5  $\mu g/L$ ) for the first time, a confirmation sample will be collected during the next regularly scheduled sampling event. If the result is confirmed, the well will be sampled on a twice-monthly basis for three months. At the conclusion of three months if the average concentration of perchlorate is below 75 percent of the perchlorate PAL (i.e., 13.5  $\mu g/L$ ) the well will then be sampled once a month. If the average perchlorate concentration is greater than 75 percent of the perchlorate PAL, then, the well will continue to be sampled on a twice-monthly basis for another three months.

In November 1998, perchlorate was detected at or above the detection limit of 4  $\mu$ g/L in three COLL wells (Mountain View #1, Mountain View #2, and Richardson #2), one COLL water system sampling points (Mountain View Blend at Lawton), ten City of Riverside Gage wells (Gage 26-1, Gage 27-1, Gage 27-2, Gage 29-1, Gage 29-2, Gage 46-1, Gage 51-1, Gage 66-1, Gage 92-1, and Gage 6 New), and one City of Riverside water system sampling point (Gage Delivery), as presented on Figure 2 and Table 4.

In the November WSCP sampling, perchlorate was detected at or above 75 percent (13.5  $\mu g/L)$  of the PAL in three wells (COLL Mountain View #1, Gage 29-2, and Gage 6 New). Gage 29-2 is currently being sampled on a twice-monthly basis when the well is on line. Mountain View #1 and Gage 6 New are sampled once a month for monitoring purposes because these wells are no longer used as potable sources of water. Gage 29-3 was off-line during November and was not sampled.

In the October 1998 WSCP sampling, Gage 51-1 detected perchlorate at a concentration that exceeded 75 percent of the PAL (14  $\mu g/L$ ). In accordance with the perchlorate decision matrix, a confirmation sample was collected from Gage 51-1 in November 1998. The November 1998 result from Gage 51-1 did not confirm the October 1998 exceedence of 75 percent of the perchlorate PAL (10  $\mu g/L$ ), and thus Gage 51-1 will continue to be sampled once a month.

Sincerely,

**HSI GEOTRANS** 

Boy J. Marroquin Project Manager

James C. Norman, R.G., C.HG.

Project Director

**TABLES** 

#### TABLE 1

#### KEY PROJECT DATES AND WSCP SAMPLING PROGRAM EVOLUTION

September 30, 1996, Lockheed Martin submitted the Water Supply Contingency Plan (WSCP) to the RWQCB – Santa Ana Region;

March 6, 1997, the RWQCB conditionally approved the WSCP, which included sampling eight production wells (City of Loma Linda Richardson #1, Richardson #2, Mountain View #1, Mountain View #2, Victoria Farms Mutual Water Company Wells #1 and #3, and Southern California Edison #1 and #2);

June 1997, Victoria Farms Mutual Water Company was connected to City of San Bernardino Water. Pumping ceased at VFMWC #1 and #3, and the two wells were removed from the program;

June 1997, sampling of SCE #1 was discontinued due to sampling logistics. The WSCP consists of five wells, including COLL Mountain View #1 and #2, COLL Richardson #1 and #2, and SCE #2 (AUX);

August 1997, the WSCP was expanded due to the detection of perchlorate in municipal supply wells in the Bunker Hill Basin. Twenty-six wells were added to the WSCP including nineteen City of Riverside wells, five City of Redlands wells, and two Loma Linda University wells, for a total of 31 wells;

October 1997, three City of Riverside water system sampling points were added to the WSCP, including the Gage system pipeline (Gage Delivery), the Waterman system pipeline (Iowa Booster), and the sampling station measuring outflow from the Linden and Evans Reservoirs (7<sup>th</sup> & Chicago);

March 1998, two City of Loma Linda water system sampling points were added to the WSCP, including the Mountain View system pipeline (Mountain View Blend at Lawton) and the Richardson system pipeline (Richardson Blend);

June 1998, one City of Riverside irrigation water system sampling point (Gage Arlington) and one additional City of Loma Linda water system sampling point (Mountain View Blend at Timoteo) were added to the WSCP.

TABLE 2
WSCP PRODUCTION WELL SAMPLING PROGRAM

HSI#	Well Name	Perchlorate	TCE				
City of Loma		Company of the Compan					
691	Mountain View #1	T X	Χ				
692	Mountain View #2	X	X				
693	Richardson #1	X	Χ				
694	Richardson #2	X	Χ				
City of Loma	Linda Water System Sampling Points						
2967		X	Χ				
3016	Mountain View - Timoteo	X	Χ				
2968	Richardson Blend	X	X				
Southern Ca	lifornia Edison	(Agg) - (Agg)	The second secon				
554	SCE#2(AUX)	X	Χ				
Loma Linda	University		The second of th				
267	LLUniv Anderson #2	X					
717	LLUniv Anderson #3	X					
	side (Gage System)		TO THE TOTAL CLASS THE TE				
252	Gage#26-1	X	X				
258	Gage#27-1	X	Χ				
259	Gage#27-2	X	X				
260	Gage#29-1	X	Χ				
219	Gage#29-2	X	Х				
220	Gage#29-3	X	X				
218	Gage#30-1	X	X				
214	Gage#31-1	X	Χ				
215	Gage#46-1	X	Х				
253	Gage#51-1	X	X				
216	Gage#56-1	X	Χ				
257	Gage#66-1	X	X				
644	Gage#92-1	X	Χ				
641	Gage#92-2	X	X				
642	Gage#92-3	X	Χ				
645	Gage 6New	X	X				
City of Rivers	side (Waterman System)						
273	Hunt#6	X					
271	Hunt#10	X					
272	Hunt#11	X					
City of Rivers	side Water System Sampling Points						
2946	Iowa Booster (Waterman)	X	Χ				
2947	Gage Delivery (Gage)	X	X				
2948	7th & Chicago (Reservoir)	X	Χ				
3018	Gage Arlington	X	Χ				
City of Redla	nds						
542	COR Church St	X					
2673	COR#38	X					
535	COR Mentone Acres	X					
29	COR Orange st	X					
74	CORRees	X	X				
Notes:	<u> </u>						

TCE = Trichloroethene

Perchlorate analyzed using DHS Method (EPA 300.0 Modified)

TCE analyzed using EPA Method 502.2

TABLE 3

# WSCP PRODUCTION WELL SAMPLING PROGRAM NOVEMBER 1998 WELLS SAMPLED TWICE MONTHLY

HSI#	Well Name	Perchlorate	TCE
City of Loma Linda		The second secon	
692	Mountain View #2	x	
City of Riverside (Gage System)	And the second s		
219	Gage #29-2	X	
220	Gage #29-3	X	

#### Notes:

TCE = Trichloroethene

Perchlorate analyzed using DHS Method (EPA 300.0 Modified).

TCE analyzed using EPA Method 502.2.

In November, Gage 29-2 was sampled only once and Gage 29-3 was not sampled at all because the wells were off-line.

# TABLE 4 WSCP PRODUCTION WELL SAMPLING PROGRAM NOVEMBER 1998 DATA RESULTS

	* *		Perchlorate (ppb)	TCE (ppb)			
HSI#	Well Name	Sample Date	Del Mar	Del Mar			
	City of Loma Linda						
691	Mountain View #1 <sup>a</sup>	11/4/98	26	1.5			
691	MUN-721 <sup>a</sup>	11/4/98	26	1.6			
692	Mountain View #2	11/3/98	9.6	ND(0.5)			
692	Mountain View #2 - Split (BAB)	11/3/98	9.0	NA			
	Mountain View #2*	11/16/98	6.1	NA			
692	Mountain View #2 - Split (BAB)*	11/16/98	ND(4)	NA			
693	Richardson #1	11/4/98	ND(4)	ND(0.5)			
	Richardson #2	11/4/98	4.4	ND(0.5)			
	Water System Sampling Points	nunde o un annade centre o	· Salara	State of the state			
	Mountain View Blend-Lawton	11/4/98	5.9	ND(0.5)			
3016	Mountain View Blend-Timoteo	11/4/98	ND(4)	ND(0.5)			
	Richardson Blend	11/4/98	ND(4)	ND(0.5)			
Southern California							
	SCE#2(AUX)	11/4/98	ND(4)	ND(0.5)			
Loma Linda Unive	rsity	, 1 , 1 , 1 , 1 , 1					
	LLUniv Anderson #2	NS	NS	NS			
	LLUniv Anderson #3	NS	NS L	NS			
City of Riverside (		ya tari t	ANALOS NASOS ESTE MEMBES				
	Gage#26-1	11/3/98	5.5	11			
	Gage#27-1	11/3/98	6.2	5.2			
	Gage#27-2	11/4/98	7.7	1.8			
	Gage#29-1	11/4/98	8.5	ND(0.5)			
	Gage#29-2	NS	NS	NS			
	Gage 29-2*	11/16/98	17	NA			
	Gage#29-3	NS	NS	NS			
	Gage#29-3*	NS	NS	NS			
	Gage#30-1	11/3/98	ND(4)	ND(0.5)			
	Gage#31-1	11/3/98	ND(4)	ND(0.5)			
	Gage#46-1	11/3/98	6.3	ND(0.5)			
	Gage#51-1	11/3/98	10	ND(0.5)			
	Gage#56-1	11/3/98	ND(4)	ND(0.5)			
	Gage#66-1	11/4/98	11	ND(0.5)			
	Gage#92-1	11/4/98	9.2	0.59			
	Gage#92-2 Gage#92-3	11/3/98 11/3/98	ND(4)	ND(0.5)			
	Gage 6 New <sup>a</sup>		ND(4)	ND(0.5)			
[ <del></del>		11/3/98	37	2.1			
1	645 MUN-720 a 11/3/98 36 2.0  Dity of Riverside (Waterman System)						
		NO I	NO I				
11	Hunt#6	NS NS	NS NS	NA NA			
	Hunt#10	NS NS	NS Ne	NA NA			
	Hunt#11	NS	NS I	NA			
	Vater System Sampling Points		NID(4)				
	Iowa Booster (Waterman) Gage Delivery (Gage)	11/5/98 11/5/98	ND(4) 4.2	ND(0.5) ND(0.5)			
	7th & Chicago (Reservoir)	11/5/98	ND(4)	ND(0.5)			
	MUN-722	11/5/98	ND(4)	ND(0.5) ND(0.5)			
	Gage Arlington	11/5/98	ND(4)	ND(0.5)			
City of Redlands							
	COR Church St	NS	NS	NA			
	COR#38	11/4/98	ND(4)	NA NA			
	COR Mentone Acres	NS	NS NS	NA NA			
	COR Orange St	11/4/98	ND(4)	NA NA			
	COR Rees	NS	NS	NS			

#### Notes:

\* = Twice-monthly sampling result

= Well not used for potable distribution

NA = Not analyzed for that compound NS = Not sampled (Well off-line)

ND(4) = Not detected at the specified limit

MUN = Duplicate sample collected from the well listed directly above

TCE = Trichloroethene

DEL MAR = Del Mar Analytical Laboratory of Irvine, CA

BAB = Babcock & Sons Laboratory of Riverside, CA

Perchlorate analyzed using DHS Method (EPA 300.0 Modified)

TCE analyzed using EPA Method 502.2

**TABLE 5** 

#### SUMMARY OF WATER LEVEL MEASUREMENTS NOVEMBER 1998 SAMPLING EVENT

	Well Name	Measure Date	Depth to Water	Measuring Point Elevation	Groundwater Elevation	Comments	
!	CITY OF LOMA LINDA						
	Mountain View #1	NM	NM	1095	NM	Static	
692	Mountain View #2	11/02/98	160	1085	925	Static	
693	Richardson #1	11/02/98	140	1077	937	Static	
694	Richardson #2	11/02/98	128	1078	950	Static	
	California Edison	alternative section of the section o	er samtataka teksi inggalan sama Teksi samtataka teksi inggalan sama			<b>第一个</b>	
554	SCE#2(AUX)	NM	NM	1100.00	NM	Pumping	
Loma Lind	a University		The state of the s	A THE RESERVE THE PROPERTY OF	では、おり、10mm 10 10mm では、10 10mm 10 10mm		
267	LLUniv Anderson #2	NM	NM	1075	NM	Pumping	
717	LLUniv Anderson #3	NM	NM	1070	NM	Pumping	
City of Rive	erside (Gage System)	in an and the state of the state of	មាន់ស្រែក្រុង			ita in pasa da	
252	Gage#26-1	11/03/98	72.3	1045.33	973.03	Static	
258	Gage#27-1	11/03/98	82.9	1044.64	961.74	Pumping	
259	Gage#27-2	11/03/98	88.4	1044.64	956.24	Pumping	
260	Gage#29-1	11/03/98	98.5	1044.43	945.93	Pumping	
219	Gage#29-2	11/03/98	67.2	1046.31	979.11	Static	
220	Gage#29-3	11/03/98	67.7	1048.75	981.05	Static	
218	Gage#30-1	11/03/98	172.6	1054.17	881.57	Pumping	
214	Gage#31-1	11/03/98	141.0	1054.64	913.64	Pumping	
215	Gage#46-1	11/03/98	123.6	1065.50	941.90	Pumping	
253	Gage#51-1	11/03/98	89.9	1044.64	954.74	Static	
216	Gage#56-1	11/03/98	171.1	1065.50	894.40	Pumping	
257	Gage#66-1	11/03/98	128.0	1044.85	916.85	Pumping	
644	Gage#92-1	11/03/98	156.5	1047.78	891.28	Pumping	
641	Gage#92-2	11/03/98	179.9	1053.38	873.48	Pumping	
642	Gage#92-3	11/03/98	173.5	1058.78	885.28	Pumping	
645	Gage 6 New	11/03/98	98.9	1067.70	968.80	Static	
City of Riverside (Waterman System)							
273	Hunt#6	NM	NM	1015.5	NM	Pumping	
271	Hunt#10	NM	NM	1017	NM	Pumping	
272	Hunt#11	NM	NM	1015.7	NM	Pumping	
City of Redlands							
542	COR Church St	Nov-98	93.0	1344.8	1251.8	Static	
2673	COR#38	Nov-98	96.0	NA	NA	Pumping	
535	COR Mentone Acres	Nov-98	143.0	1506.4	1363.4	Static	
29	COR Orange st	Nov-98	114.0	1282	1168.0	Pumping	
74	COR Rees	Nov-98	187.0	1490	1303.0	Static	

#### Notes:

All measurements reported in feet below measuring point (ft-bmp)

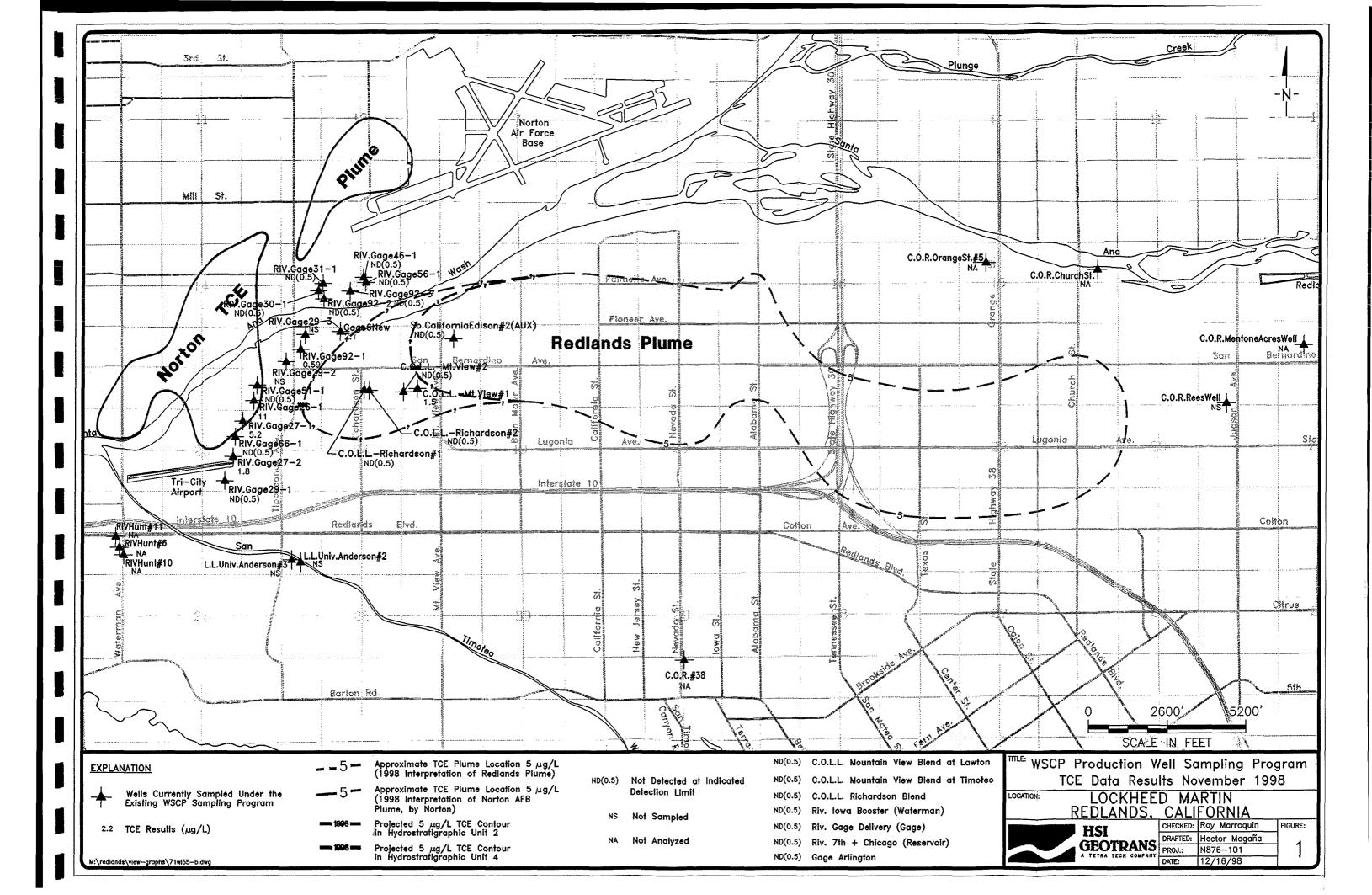
Water level measurements for all City of Loma Linda, City of Riverside, and City of Redlands wells were obtained by purveyor personnel. Elevations given in feet above mean sea level (ft-msl)

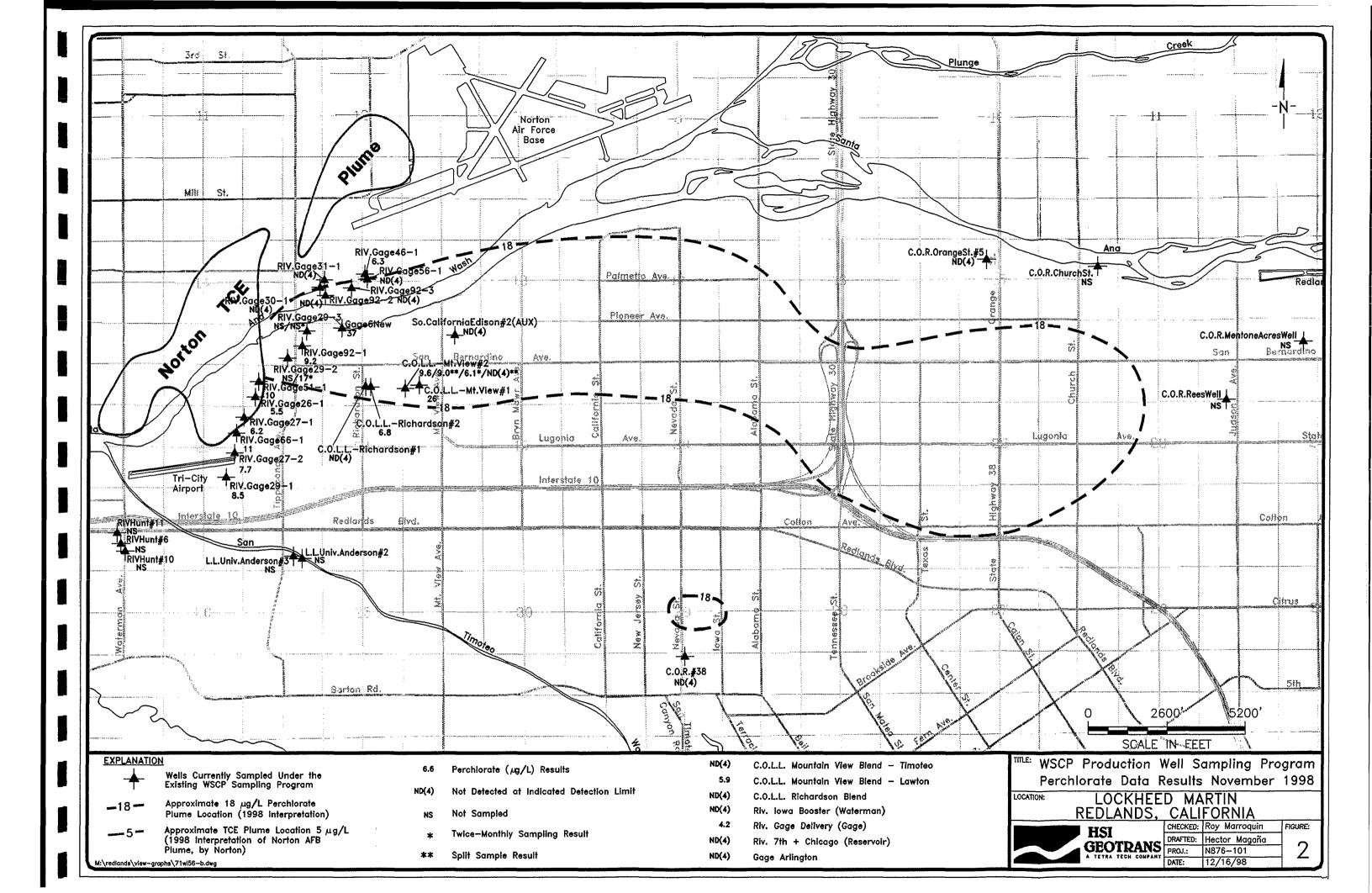
NM=Not measured

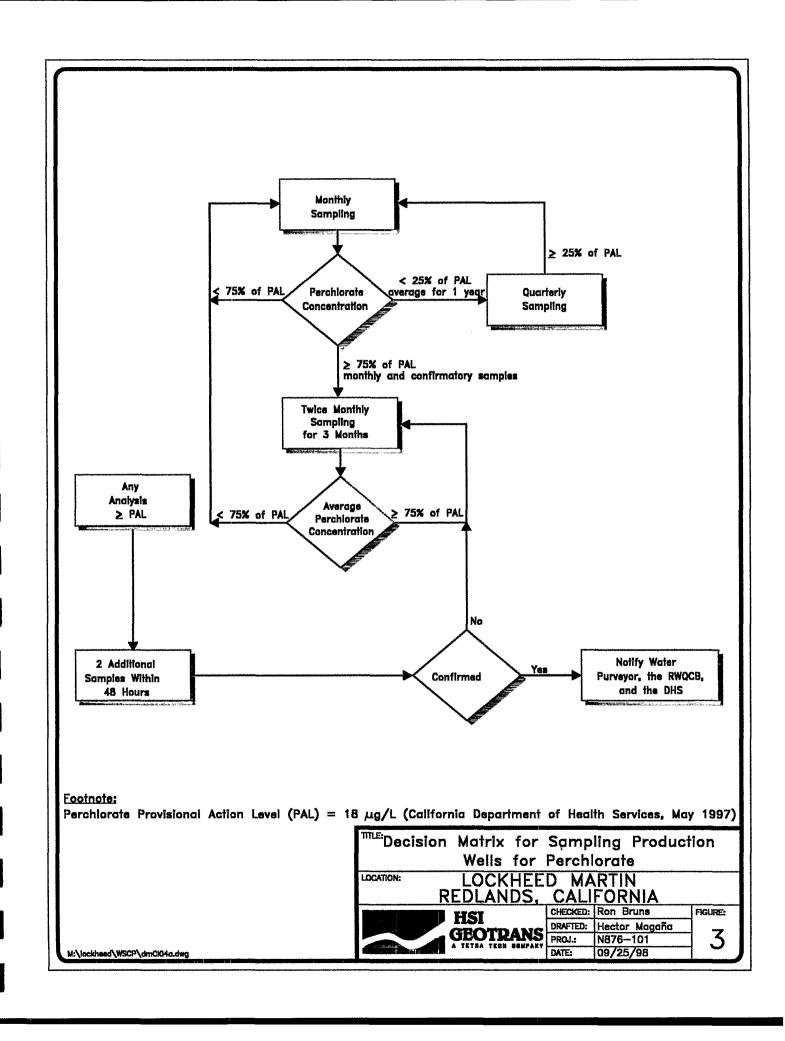
NA=Data not available

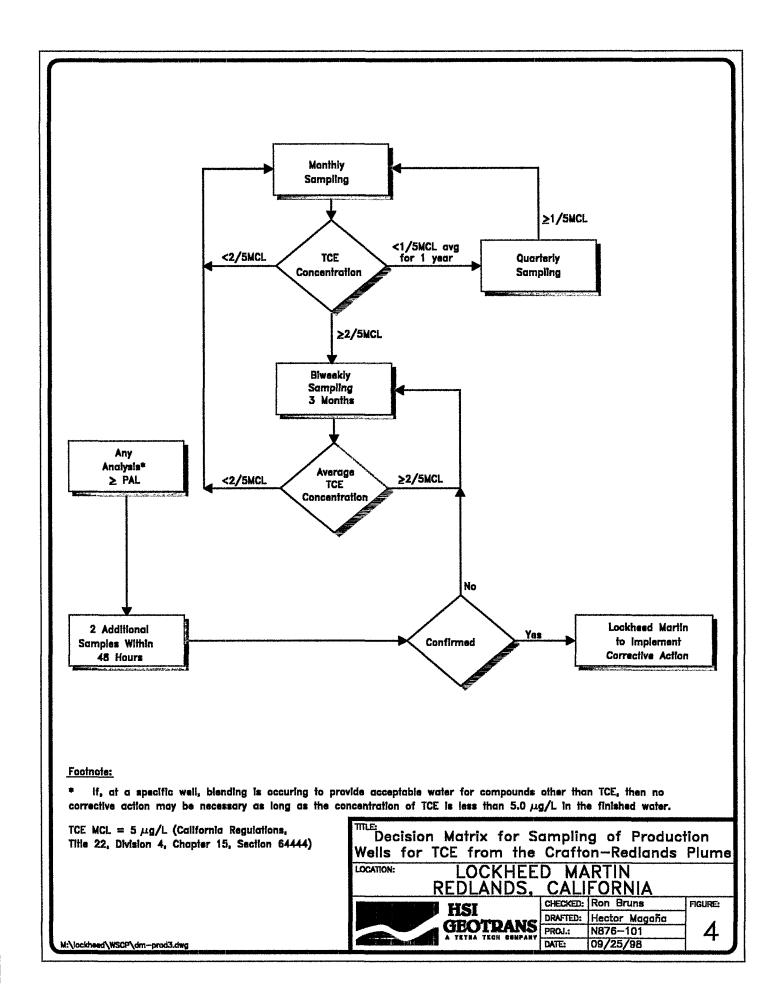
Static water levels were allowed to recover a minimum of 30 minutes to obtain a static water level measurement

**FIGURES** 









ATTACHMENT A
GEOLIS FIELD FORMS

# **ATTACHMENT A**

GEOLIS FIELD FORMS (Available Upon Request)

#### ATTACHMENT B

CHAIN-OF-CUSTODY RECORDS AND LABORATORY DATA SHEETS

# **ATTACHMENT B**

CHAIN-OF-CUSTODY RECORDS AND LABORATORY DATA SHEETS (Available Upon Request)

### ATTACHMENT C

LEVEL III
QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION

# ATTACHMENT C

LEVEL III
QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION
(Available Upon Request)

Lockheed Martin Corporation Corporate Environment, Safety & Health West Coast Projects Office 2550 North Hollywood Way, 3rd Floor, Burbank, CA 91505-1055 Facsimile 818-847-0256 or 818-847-0170

LOCKHEED MARTIN

Via Federal Express CAY0199/011 WBS# 48720

January 25, 1999

Mr. Gerard J. Thibeault Executive Officer California Regional Water Quality Control Board Santa Ana Region 3737 Main Street, Suite 500 Riverside, California 92501-3339

Subject:

November 1998 Data Report Water Supply Contingency Plan Production Well Sampling Program Crafton-Redlands Plume Project

Dear Mr. Thibeault:

In compliance with the approved Water Supply Contingency Plan, enclosed please find one copy of the **November 1998**, **Production Well Sampling Program** report prepared by HSI-Geotrans for the Lockheed Martin Corporation. This report presents analytical results from samples collected at Bunker Hill Basin Production Wells in November of 1998. Laboratory Quality Assurance/Quality Control documentation is in Attachment C which is also enclosed for your review.

Should you have any questions, comments, or requests, please contact Tom Blackman at (818) 847-0791 or John Hemmans at (818) 847-0191.

Sincerely,

Carol A. Yuge

Director

**Enclosures** 

cc: See Attached Distribution List

#### Distribution:

cc:

(Abbreviated Report Without Attachments "A, B, & C" Which are Available Upon Request)

Kalyanpur Baliga, Department of Health Services (San Bernardino)

Tom Bartol, USAF, Norton Air Force Base

Henry Dennis, Mountainview Power Company

Dodie Farmer, Victoria Farms Mutual Water Company

Gary Forth, City of Loma Linda

Douglas Headrick, San Bernardino Valley Water Conservation District

Mike Huffstutler, City of Redlands

Ross Lewis, Gage Canal Company

-Kevin Mayer, US EPA (Region IX)

Steve Mains, Western Municipal Water District

Morris Matson, Loma Linda University

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